

Amendments to the Claims

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Previously presented) A catheter apparatus for the therapeutic embolization of aneurysms, the catheter apparatus comprising:

a catheter configured to inject a filling material into the aneurysm;
an active locator attached to a tip of the catheter and configured to provide coordinates to determine a spatial position and/or orientation of the catheter;
a pump configured to controllably supply filling material to the catheter; and
a monitor connected to the active locator and the pump, wherein the monitor is configured to monitor the spatial position and/or orientation of the catheter based on the provided coordinates from the locator to detect emergence of the tip of the catheter from the aneurysm during the injection of the filling material into the aneurysm, and configured to stop the supply of the filling material in response to the detected emergence.

2. (Previously presented) The catheter apparatus as claimed in claim 1, wherein the active locator comprises a magnetic field sensor.

3-4. (Canceled)

5. (Previously presented) An apparatus for the therapeutic embolization of aneurysms, the apparatus comprising:

a catheter for injecting a filling material into an aneurysm;

a locating device and at least one active locator fitted on a tip of the catheter, the locating device providing coordinates for determining a spatial position and/or orientation of the locator;

a pump device for controllably supplying filling material to the catheter; and

a monitoring unit connected to the locating device and the pump device, the monitoring unit is operative to monitor the spatial position and/or orientation of the catheter based on the provided coordinates from the locator to detect emergence of the catheter from the aneurysm during the injection of the filling material into the aneurysm, and thereupon stopping the supply of the filling material.

6. (Previously presented) The apparatus as claimed in claim 5, wherein the monitoring unit comprises a memory having a road map stored therein, and a recorder for recording the measured position of the locator using the road map.

7. (Previously presented) The apparatus as claimed in claim 5, further comprising an X-ray device.

8. (Previously presented) The apparatus as claimed in claim 5, wherein the locating device

determines the position and/or orientation of the tip of the active locator by at least one of a mechanical, electromagnetic, optical and/or acoustic method.

9. (Previously presented) The apparatus as claimed in claim 8, wherein the active locator comprises a magnetic field sensor and the locating device comprises a field generator for generating an electromagnetic field which is spatially and/or temporally inhomogeneous.

10. (Previously presented) The apparatus as claimed in claim 5, wherein the filling material is selected from at least one of a curable polymer material, plastic beads, a plastic coil, a hydrogel and/or a fibrin sponge.

11. (Previously presented) A method of controlling the supply of a plugging material to a catheter employed in the therapeutic embolization of an aneurysm, the method comprising the acts of:

determining a position and/or orientation of a tip of the catheter from coordinates provided by an active locator fitted thereon;

automatically monitor the spatial position and/or orientation of the catheter based on the coordinates provided by the locator; and

stopping the supply of the plugging material to the catheter if emergence of the catheter from the aneurysm is detected based on the monitored spatial position and/or orientation of the catheter.

12. (Previously presented) The method as claimed in claim 11, comprising an act of recording the position of the locator in a road map of locator positions, the detecting of the emergence of the catheter from the aneurysm further being based on the road map.

13. (Previously presented) The method as claimed in claim 11, wherein the catheter and the aneurysm are imaged together at the start of embolization, by at least one of X-rays and administration of a contrast agent.

14. (Previously presented) The method as claimed in claim 11, further comprising the act of navigation of the catheter in the vascular system outside the aneurysm, the act of navigation is assisted by determining the position of the active locator.